

NAVAL WAR COLLEGE  
Newport, RI

**"JOINT THEATER MISSILE DEFENSE:  
THE PROBLEM WITH ACTIVE DEFENSE DOCTRINE"**

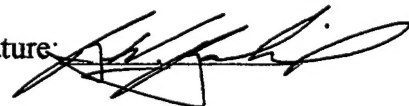
**An in-depth look at current Joint Doctrine  
and proposal for changes that aid Theater Commanders  
in establishing defensive priorities.**

By

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A paper submitted to the Faculty of the U.S. Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal view and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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## **Abstract**

In today's dynamic and complicated environment of Joint Theater Missile Defense (JTMD) current doctrine provides ambiguous guidance to Theater Commanders in Chief (CINC) or Joint Force Commanders (JFC) in the proper establishment of JTMD priorities for theater assets. Currently there is no doctrinal system established, to provide Theater Commanders the guidance essential to properly employ of those JTMD assets to counter an ever-growing missile threat. The proliferation of Weapons of Mass Destruction (WMD) and the ability to deliver those weapons through Theater Missiles (TM) has only served to heighten the importance of coordinating limited theater assets to counter current and future threats. The proper employment of limited assets, established on sound principles and doctrine, is essential for the success of JTMD in today's environment.

This paper explores needed changes in the current active defense doctrine as pertaining to prioritization of critical theater assets for defense against TMs. The proposed changes would establish a standard protocol; based on a systematic approach, to assign limited JTMD systems to protect specifically identified critical theater assets. The proposed changes are based on the potential for serious restrictions on availability of future systems, due to budget constraints and technological setbacks. For those reasons, planners will have the requirement to judiciously employ limited JTMD assets to counter a growing threat.

We have received a report that a Scud fired at Dhahran has struck an U.S. barracks. The explosion killed twenty-eight of our troops and wounded many more. It was a terrible tragedy-this terror weapon lunged into the sky that by sheer fate happened to fall where we had a concentration of troops-and it brought home once again to our side the profanity of war. I was sick at heart.<sup>1</sup>

General H. Norman Schwarzkopf

## **Introduction**

Current Joint Theater Missile Defense (JTMD) doctrine provides ambiguous guidance to Theater Commanders in Chief (CINC) or Joint Force Commanders (JFC) in the proper establishment of JTMD priorities for critical theater assets. Currently, there is no doctrinal system established to provide Theater Commanders the guidance essential to properly employ those JTMD assets to counter an ever-growing missile threat. The proliferation of Weapons of Mass Destruction (WMD) and the ability to deliver those weapons through Theater Missiles (TM) has only served to heighten the importance of coordinating and employing limited theater missile defense assets to counter current and future threat. The judicious employment of limited missile defense systems must be based on fundamentally sound doctrine and is essential for the success of JTMD in today's environment.

Prior to the United States' involvement in Operations Desert Shield and Desert Storm, limited attention or emphasis had been placed on JTMD. In fact, very few service members or civilian leaders had a clear understanding of United States military capabilities to counter the ever-growing missile threat that faced our forces in the Gulf. Operation Desert Shield and Desert Storm was the first large-scale battle in which the

United States and her allies faced a foe that not only possessed Theater Ballistic Missiles (TBM), but had shown a willingness to use those assets. During the forty-three days of the war, Iraq launched a total of eighty-six Scud or modified Scud ballistic missiles at targets in Israel and Saudi Arabia.<sup>2</sup> The ability of the US to counter the Iraqi missiles rested solely on the Patriot missile system, which was designed to counter air-breathing threats (aircraft, cruise missiles, and unmanned aerial vehicles) and not TBMs. Despite advocates' strong support of Patriot, it had only marginal success during the conflict and highlighted a severe weakness in US military capabilities.<sup>3</sup>

In testimony before the House Defense Policy Panel in April 1991, Massachusetts Institute of Technology Professor Theodore Postol questioned the effectiveness of the Patriot in the Gulf War. Postol stated, "Even an outstandingly capable air defense system like the Patriot could not, and did not, prevent considerable damage on the ground from a remarkably primitive threat that did not even incorporate countermeasures."<sup>4</sup> He went on to ask lawmakers to consider the following facts:

1. Based on preliminary press reports before Patriot was deployed to Israel, 13 Scuds were launched and damaged 2,698 apartments, wounding 115 people.
2. After the Patriot batteries were deployed to Israel, 11 more Scuds were launched, each of which was intercepted by Patriot missiles. However, ground damage from the falling debris increased to 7,778 apartments damaged and 168 injured.<sup>5</sup>

Staunch supporters of Patriot will argue that Professor Postol's facts are misleading and fail to reflect actual hit percentages Patriot achieved or the success achieved through the "perception" of defense for the Israeli people during the conflict. Though there may be some validity to that argument, much of the "success" the US achieved against the Iraqi TBM threat was based on several distinguishable points. First,

the Scud was primitive technology. It was poorly constructed, unable to maneuver in flight, and tended to disintegrate once fired. Second, the failure of Iraqi forces to utilize Scuds in mass made detection and intercept of the missiles much easier for coalition forces. Additionally, Patriot defended the preponderance of assets Iraq targeted; they failed to attack front line units, oil fields, or critical port facilities and airfields.<sup>6</sup>

Professor Postol's testimony exemplifies several points, which, after Desert Storm, few military or congressional leaders would argue; that the United States was ill-prepared to combat TBMs in either doctrinal employment, system capabilities, or JTMD asset availability.

Today, one of the most common questions proposed to military leaders is; what is the threat? In a greater context the question becomes extremely complex. However, in the realm of TBMs the threat is quite clear and continuously growing. In a recent report by the Rumsfeld Commission to the House Armed Services Committee, former Secretary of Defense Rumsfeld noted,

"Concerted efforts by a number of overtly or potentially hostile nations to acquire ballistic missiles with biological or nuclear payloads pose a growing threat to the United States, its deployed forces, and its friends and allies....The threat to the US posed by these emerging capabilities is broader, more mature and evolving more rapidly than has been reported in estimates and reports by the intelligence community."<sup>7</sup>

The report goes on to note a number of nations which continue to develop and test ballistic missile technologies, included are nations that pose a serious threat to the United States, her allies, and regional stability. Particular attention was directed toward the recent nuclear tests in both India and Pakistan, the North Korean launch of a complex three-stage ballistic missile, and indications from the intelligence community of Iranian

acquisition of solid fuel technologies.<sup>8</sup> Appendix A provides a more comprehensive look into countries that currently have active missile development programs.

For many third-world nations, TBMs are more economically advantageous than an air force, and provide a powerful political and economic presence that was previously unattainable.<sup>9</sup> The wide dissemination of technological information and illegal acquisition of designs and hardware from the former Soviet Union is evidently the main tip of the spear. Exportation of missile technologies has enabled those countries that desire to develop and employ WMD much easier. The threat the CINC or JFC faces in future conflicts is not only from the employment of TBMs with conventional warheads but also the employment of nuclear, biological, and chemical equipped missiles.

### **JTMD Systems**

Since the Gulf War, the US has devoted enormous time, effort, and monetary assets to develop a doctrine and "family of systems" to counter the problem of TBMs. The greatest concentration of effort has been placed on the development of technologies which can detect, locate and destroy TBMs. These systems include the Army's Patriot Advanced Capability-3 (PAC-3) and Theater High Altitude Area Defense (THAAD), the Navy's Navy Area Defense (NAD) and Navy Theater Wide system (NTW), and the Air Force's Airborne Laser (ABL).

The Patriot PAC-3 is a vast improvement over the PAC-2 system, the system that was deployed to the Persian Gulf in 1990. The PAC-3 upgrade will significantly improve the current missile by adding a more lethal "hit-to-kill" capability. Additional systems

upgrades will provide a remote launch capability that extends the protective coverage of the system, and presents a more difficult target for the enemy to find and destroy.<sup>10</sup> In addition to the improved missile capabilities, significant effort has been placed on improvements in computer software and radar upgrades to provide the CINC or JFC an air and missile defense system with increased multi-target engagement capacity and joint system interoperability.<sup>11</sup>

Despite the improvements in the Patriot system, the Army recognized the requirement for an upper tier system to complement the lower tier capabilities of PAC-3. The answer seems to rest in the Theater High Altitude Area Defense (THAAD) system. In conjunction with the continuous upgrades on the Patriot, the Army has invested heavily in the development and testing of THAAD. This system is designed to protect large areas and deployed forces within a contingency theater from TBMs. THAAD uses a "hit-to-kill" technology and is designed to engage missiles in the exoatmosphere or outside the atmosphere, which should aid in minimizing debris fallout on defended assets, a problem typically associated with lower tier systems.<sup>12</sup>

The Navy Area Defense (NAD) system is similar to the Army's PAC-3 Patriot. This system leverages upgrades to current Aegis cruisers and destroyers equipped with the Standard Missile (SM). The NAD will provide a lower tier sea-based area JTMD capability expanding on the existing Aegis Weapon System (AWS). The Navy has modified the AWS, including the SM-2, to enable TBM detection, tracking and engagement. First deployed in fiscal year 1998, the AWS is now capable of detecting TBMs through autonomous search, cueing from other ships or remote cues from national level sensors.<sup>13</sup>



Paralleling the Army's efforts, Navy Theater-Wide Defense (NTWD) is a complementary program designed to provide an upper tier, sea-based capability to counter TBM threats. This program builds on the Navy Area Defense program and the SM-2 Block IV to develop a Lightweight Exoatmospheric Projectile (LEAP). The LEAP should be deployed on Aegis surface combatants by the year 2005 and will greatly enhance the ability of the CINC to provide a truly expeditionary and forward-deployed theater missile defense.<sup>14</sup>

In contrast to the previously mentioned programs, the Air Force's Airborne Boost Phase Intercept (BPI), more commonly referred to as the Airborne Laser (ABL) program, is still in development, but focuses on intercepting ballistic missiles during their most vulnerable portion of flight, the boost or ascending phase. This capability may serve as a deterrent to launch or may ensure the weapon is destroyed prior to submunition release in order to minimize debris fallout on friendly territory.<sup>15</sup>

Clearly, military and civilian leaders have placed significant emphasis on the development of systems capable of countering today and tomorrow's missile threats. Despite the enormous efforts, there exists significant limitations in both technological capabilities and budgetary constraints associated with current and future JTMD systems. Congressional reviews conducted in 1999 highlight the significant technological obstacles that THAAD and the Navy's NTW face, citing "serious setbacks, including 13 of 17 test failures of antimissile intercepts over the past decade."<sup>16</sup> The ramifications for the CINC or JFC is certainly that the failures and other problems will cause major delays in the programs, thus impacting the availability of TMD assets in support of theater commitments. Thus, the reliance on limited legacy systems, such as Patriot and Aegis,

will significantly increase. Increased operational dependence on these systems raises serious questions on the availability of JTMD assets for the CINCs. This increases the potential that the CINC or JFC will likely receive only limited JTMD assets for employment within a given theater. The challenge to JTMD planners is determining which assets within a theater to defend with a limited number of JTMD systems.

### **Joint Doctrine for Active Defenses**

Proliferation of missile technologies and acquisition of WMD capabilities present the CINC or JFC with a multitude of operational, and in many cases, strategic concerns regarding the apportionment and assignment of JTMD assets. The complexity of the issue is much grander than just the threat, and encompasses the employment of limited JTMD assets to counter the threat. Theater missile defense also requires doctrine, which provides the necessary guidance to successfully counter the threat. Joint Publication 3-01.5, Doctrine for Joint Theater Missile Defense, provides only limited guidance for CINCs to properly employ limited JTMD assets. Theater missile defense doctrine is directly correlated to, and reflects, many of the basic premises in the employment of traditional air defense assets. Currently, joint doctrine is void of an air defense doctrine although the two are clearly related and mutually supportive. Establishing defensive priorities in future conflicts will become increasingly difficult with fewer and fewer assets to counter the expanding threat within a theater. The procedures for establishing theater air defense priorities, which we will examine, are applicable to the process of developing theater missile defense priorities.

Current Joint Doctrine establishes the four operational elements or "pillars" of Joint Theater Missile Defense (JTMD): Passive Defense, Active Defense, Attack Operations, and TMD Command, Control, Communications, Computers, and Intelligence (C4I). Although significant effort was placed on all "pillars" during the Gulf War, the preponderance of attention since has been directed towards Active Defense, the most highly publicized element of JTMD. It is in this area that I will concentrate this paper.

Joint Doctrine defines the role of active defense operations as "operations to protect selected assets and forces from attack by destroying TM launch platforms and/or TMs in flight."<sup>17</sup> It further states that "active defense operations defend only what is most important or critical due to resource limitations."<sup>18</sup> Close examination of individual service doctrine reveals a number of commonalties regarding employment principles, whether related to Air Defense or TMD. We see these principles described as mass, mobility, surprise, economy of effort, unity of effort, or appropriate force, all very similar in purpose, but not recognized as standard in the joint arena.<sup>19</sup>

For most military planners, the aforementioned principles appear closely aligned to the principles of war as described in Joint Doctrine (see Appendix B).<sup>20</sup> These principles provide the CINC or JFC a solid starting point for initial planning and employment of theater assets and are the most commonly accepted joint methodology for the application of the United States' military might. Although there is applicability to all aspects of warfare, the principles of war fail to encompass all the requirements necessary in establishing priorities for defense for JTMD. However, much like the principles of war, JTMD doctrine requires an accepted formal "system" or process to establish defensive priorities.

## **The JTMD Priority System**

Joint Publication 3-01.5, currently provides examples of "selected critical assets" including forces, air bases, seaports, population centers, and fleet operating areas.<sup>21</sup> The Joint Doctrine is fatally ambiguous and fails to provide the CINC or JFC with a usable "system" designed to prioritize those "selected assets" for defense as recommended in current doctrine. The general practice for allocation and employment of JTMD assets is often based on add-hoc procedures and is dependent on the aptitude resident within a few individual planners. Examination of currently established service doctrines, although service specific in many ways, is similar and translates effectively to what is commonly perceived as a process or "system" of establishing defensive priorities.

Prioritizing assets for JTMD should rely on four elements; criticality, vulnerability, recoverability, and threat. Each element represents a unique aspect related to an individual theater asset and should be examined for their individual and collective impact on mission accomplishment. The method for establishing JTMD priorities can be conducted as a systematic or deliberate approach, as illustrated in Appendix C or can be a less formalized process dependent on time, forces, and space factors within the theater. Regardless of the approach the system utilized should contain the elements described in the following paragraphs.

The first step in prioritizing assets for defense is to identify those assets critical to mission success. Criticality is a determination by the CINC or JFC of the relative importance of various assets which are essential to operational success within a theater.

To determine criticality, the commander must prioritize those assets by considering which of them, if damaged or destroyed, would significantly threaten the success of a given mission.<sup>22</sup> Clearly, if the destruction of an asset causes immediate and serious interference with the execution of the strategic or operational objectives, the CINC would then be obligated to ensure this becomes a priority for defense. However, if the loss of an asset would ultimately cause only limited interference with the accomplishment of operational objectives, the CINC may assign a lower priority to that asset. Arguably, this determination is inherently difficult in view of conflicting demands to protect a variety of military and geopolitical assets. For example, consider the challenges in the Gulf War of protecting the host nation population centers, allied forces, and protecting outside nations (Israel) to limit escalation of the conflict.

Understandably, these defended assets can prove to be vital to the CINC's or JFC's ability to conduct operations; however, the criticality of a particular asset must be balanced between several other important aspects. One such aspect CINC or JFC should consider surrounds the vulnerability of critical theater assets. Vulnerability is the characteristic of an asset, which reflects how susceptible an asset is to damage or destruction by enemy action.<sup>23</sup> Vulnerability varies based on the asset and the attacking weapon system. The CINC must consider each asset's ability to withstand attack with respect to conventional ordinance and WMD delivered by TMs. With respect to each asset, additional consideration should be placed on the specific asset's role in the overall Theater operation and the degree to which the asset can be dispersed or displaced to another position. Relocating an asset may negate the enemy's ability to target that asset, thus eliminating the immediate requirement for dedicated JTMD.

Another vital aspect which must be considered by the CINC or JFC is the ability of the assets to recover if attacked and damaged or destroyed. Recoverability of assets plays an important role in the determination of priorities for defense and alignment of forces that would ensure survivability within the theater. The degree to which the asset can recover from inflicted damage should often be the key in determining the alignment of defensive priorities. This aspect can be more clearly determined when measured in terms of time, force, and space. If the CINC has sufficient ground forces in theater, but has few air facilities and limited ability to rebuild or replace those facilities, priority would be placed on protecting the air facilities. Conversely, if the Theater is limited in ground forces with finite reinforcements, but has sufficient air facilities, the CINC or JFC may determine the recoverability of ground troops is limited and thus place a higher priority for defense of those forces.

The final aspect of establishing defensive priorities should be based on threat characteristics, which is used to determine the appropriate TMD asset necessary to provide the most adequate defense of the defended asset. Through Intelligence Preparation of the Battlefield (IPB), the CINC can estimate likely enemy actions. This is useful in determining the likelihood of a targeted attack on a specific asset. A thorough intelligence analysis can provide substantial aid in the determination of alignment of available active defense assets.

The evaluation and assignment of JTMD priorities is based on information reflecting a "snap-shot" in time and does not account for changing conditions within, and outside, the theater of operations. Planners must continuously reevaluate JTMD priorities and the allocation of defensive assets. This review of priorities could be conducted on a

daily basis, however, it would be more likely to be in conjunction with phases of a particular operation. For example, Desert Shield, during the lodgment phase, the influx of allied air and ground forces was critical to the defense of Saudi Arabia. The seaport of Al Jubail and air facilities in Riyadh and King Khalid Military City were essential to continuing the steady flow of forces and equipment. However, once the lodgment phase was complete and allied forces prepared for the offensive operations of Desert Storm, the Al Jubail seaport became less critical, although still important for logistically sustaining forces deployed in the theater. The example, although simplistic in nature, demonstrates the necessity of a continuous and deliberate reevaluation of JTMD priorities. As operational objectives and the focus of main effort shifts during progressive phases of an operation, so must JTMD priorities.

Clearly, a need exists for a formalized system to determine and assign priorities for JTMD, as well as a need to continuously reevaluate and update assigned priorities. However, the question remains who is responsible for determining and reevaluating JTMD priorities? I submit that the responsibility to develop and recommend to the CINC or JFC should reside with the most qualified person, in this arena, the Area Air Defense Commander (AADC). Typically, the AADC is the component commander with the preponderance of air defense assets in theater and the C4I capability to plan and execute integrated air defense operations.<sup>24</sup> Although the CINC or JFC is ultimately responsible for the JTMD plan, the AADC usually possesses both the experience and subordinate staff to develop and recommend JTMD priorities.

Some will argue that current doctrine provides sufficient guidance to CINCs on the employment of JTMD assets and future systems such as THAAD and NTW.

Proponents of the current doctrine argue that systems with substantially increased ranges will eliminate the need for asset allocation to cover specifically prioritized assets. Deploying systems with greater capabilities such as THAAD will thus eliminate the need and relevance for doctrinal changes.

Arguably, future systems will have increased ranges and capabilities, such as the ability to engage multiple targets with a single system. However, due to funding constraints and the enormous cost associated with these systems, we can expect to find few systems being fielded. As previously mentioned, in recent debates during congressional hearings, TMD programs have come under significant fire. Test failures and other problems associated with THAAD and NTW have caused major delays in the programs and boosted their costs. The costs for THAAD have risen from 4.3 billion dollars to an estimated 7.7 billion dollars.<sup>25</sup> The few systems that we can expect to be fielded due to developmental overruns are envisioned to acquire a global deployment mission, limiting availability to the CINC. It becomes increasingly doubtful that Theater Commanders will have sufficient JTMD assets to cover required priority assets.

Clearly, to successfully counter TMs, the CINC or JFC will have to rely on doctrine to properly plan and employ the limited JTMD assets available. The JTMD system proposed in this paper will provide planners with a standardized method for determining JTMD priorities and effective allocation of limited JTMD systems.



## **Conclusion**

In light of the continued proliferation of TM technologies and the employment of WMD in conjunction with those missile technologies, JTMD will have greater importance in theater operations. The CINC or JFC will face an ever-growing TM threat. To counter the looming threat, commanders will rely heavily on state-of-the-art JTMD systems, however we may find that these limited assets is short supply. Planners must appropriately employ those limited JTMD assets to maximize the effectiveness of those systems within a theater. The judicious employment of JTMD assets in future conflicts must be based on accepted and sound joint doctrine.

Current doctrine offers only ambiguous direction for the proper defense of limited critical theater assets. The formal establishment of a "system" or process within joint doctrine, to establish priorities for defense is a step in the right direction. Implementing the proposed changes to the current doctrine will ensure that a standard, judicious method for establishing defensive priorities is utilized by all military planners in JTMD.

## APPENDIX A: World Ballistic Missile Programs<sup>26</sup>

Country	System	Type	Range (km)	Status
Afghanistan	SS-1 Scud-B	SRBM	300	In Service
Algeria	SS-1 Scud-B	SRBM	300	In Service
Argentina	Alacran	SRBM	200	In Service
Brazil	MB/EE-150	SRBM	150	Terminated
	SS-300	SRBM	300	Terminated
	SS-600	SRBM	600	Terminated
China	CSS-2	MRBM	2,800	In Service
	CSS-3	IRBM	4,7500	In Service
	CSS-4	ICBM	12,000	In Service
	CSS-N-3	SLBM	1,700	In Service
	CSS-6	SRBM	600	In Service
	CSS-7	SRBM	300	In Service
	DF-25	MRBM	1,700	In Development
	DF-31	ICBM/SLBM	8,000	In Development
Egypt	DF-41	ICBM	7,440	In Development
	SS-1 Scud-B	SRBM	300	In Service
	Scud derivative	SRBM	450	In Service
India	Vector-Condor II	SRBM	800-1,000	Unknown
	Prithvi-150	SRBM	150	In Service
	Prithvi-250	SRBM	250	Tested
Iran	Prithvi-350	SRBM	350	In Development
	Agni	MRBM	1500-2500	In Development
	Surya	ICBM	12,000	In Development
Iraq	M-11 variant	SRBM	300	In Development
	Mushak-200	SRBM	200	In Development
	Nodong-1	SRBM	1,000	Unknown
	SS-1 Scud-B	SRBM	300	In Service
	Scud-C	SRBM	500-700	In Service
	Tondar-68	SRBM	1,000	In Development
Israel	Ababil-100	SRBM	130-140	In Development
	SAKR 200	SRBM	150	In Development
	Al Hussein	SRBM	600	In Service
North Korea	Jericho I	SRBM	480	In Service
	Jericho II	MRBM	1,450	In Service
	Jericho III	MRBM	2,800	In Development
South Korea	Scud-B variant	SRBM	300	In Service
	Scud-C	SRBM	500	In Service
	Nodong-1	SRBM	1,000	Unknown
	Taepo Dong-1	MRBM	1,500-2,000	In Development
	Taepo Dong-2	IRBM	4,000-6,000	In Development
Libya	NHK-1	SRBM	250	In Service
	NHK-A	SRBM	300	In Development
Pakistan	SS-1 Scud-B	SRBM	300	1,000
	Al-Fatah	MRBM	Unknown	Unknown
Pakistani	Hatf-2	SRBM	280	In Development
	Hatf-3	SRBM	600	Unknown

	M-11	SRBM	300	Unknown
Saudi Arabia	CSS-2	MRBM	2,650	In Service
South Africa	Arniston	MRBM	1,450	Terminated
Syria	SS-21	SRBM	70	In Service
	SS-1 Scud-B	SRBM	300	In Service
	Scud-C	SRBM	500	In Service
Taiwan	Ching Feng	SRBM	130	In Service
	Sky Halberd	SRBM	300	In Development
	Tien Ma	SRBM	900	In Development
UAE	SS-1 Scud-B	SRBM	300	Unknown
Vietnam	SS-1 Scud-B	SRBM	300	In Service
Yemen	SS-21	SRBM	70	In Service
	SS-1 Scud-B	SRBM	300	In Service

SRBM- Short Range Ballistic Missile (up to 1,000 km range)

MRBM- Medium Range Ballistic Missile (1,000 to 3,000 km range)

IRBM- Intermediate Range Ballistic Missile (3,000 to 5,500 km range)

ICBM- Intercontinental Ballistic Missile (ranges greater than 5,500 km)

## **APPENDIX B: The Principles of War<sup>27</sup>**

The principles of war guide warfighting at the strategic, operational, and tactical levels. The principles are the enduring bedrock of US military doctrine.

- a. Objective: The purpose of the objective is to direct every military operation toward a clearly defined, decisive, and attainable objective. The objective of combat operations is the destruction of enemy armed forces' capabilities and will to fight.
- b. Offensive: The purpose of an offensive action is to seize, retain, and exploit the initiative. Offensive action is the most effective and decisive way to attain a clearly defined objective.
- c. Mass: The purpose of mass is to concentrate the effects of combat power at the place and time to achieve decisive results. To achieve mass is to synchronize appropriate joint force capabilities where they will have decisive effects in a short period of time.
- d. Economy of Force: The purpose of the economy of forces is to allocate minimum essential combat power to secondary efforts. Economy of force is the judicious employment and distribution of forces.
- e. Maneuver: The purpose of maneuver is to place the enemy in a position of disadvantage through the flexible application of combat power. Maneuver is the movement of forces in relation to the enemy to secure or retain positional advantage, usually in order to deliver-or threaten delivery of-the direct and indirect fires of the maneuvering forces.
- f. Unity of Command: The purpose of unity of command is to ensure unity of effort under one responsible commander for every objective. Unity of command means that all forces operate under a single commander with the requisite authority to direct all forces employed in pursuit of a common purpose.
- g. Security: The purpose of security is to never permit the enemy to acquire unexpected advantage.
- h. Surprise: The purpose of surprise is to strike the enemy at a time or place or in a manner for which it is unprepared.
- i. Simplicity: The purpose of Simplicity is to prepare clear, uncomplicated plans and concise orders to ensure thorough understanding.

**APPENDIX C: Example of Deliberate  
Approach to JTMD Prioritization<sup>28</sup>**

<b>Asset</b>	<b>Criticality</b>	<b>Vulnerability</b>	<b>Recoverability</b>	<b>Threat</b>	<b>Total</b>	<b>Priority</b>
Airfield #1	1	1	3	2	7	1
Airfield #2	5	3	4	3	15	3
Airfield #3	5	5	6	5	21	6
Seaport #1	2	3	1	3	9	2
Seaport #2	4	5	4	7	20	5
Ground Forces	3	8	6	5	22	7
Population Center	7	3	5	2	17	4
Fleet	3	10	3	8	24	8

\*Numerical value is assigned to an asset in relation to each element from 1 through 10.

-Criticality - lower values represent relative importance or “how” critical that asset is to accomplishing CINC/JFC mission.

-Vulnerability - asset values are assigned from most vulnerable (lowest value) to least vulnerable (highest value) to enemy attack.

-Recoverability - values assigned based on an assets inability and relative speed to recover, lowest value assigned to assets which cannot quickly recover from enemy attack.

-Threat – value is assigned lowest to highest based on the likelihood and ability of the enemy to attack that asset. (This should be conducted in conjunction with IPB)

-Asset values are totaled, the asset with the lowest total value is assigned the highest priority for defense.

## Endnotes

<sup>1</sup> Joint Chiefs of Staff, "Doctrine for Joint Theater Missile Defense," *Joint Pub 3-01.5*, (Washington: 22 February 1996), 1-1.

<sup>2</sup> Richard S. Girven, "Control of Active Defenses of Joint Theater Missile Defense: Whose Mission is it?" (Army Command and General Staff College, Fort Leavenworth, Kansas, 1997), 16.

<sup>3</sup> David B.H. Denoon, *Ballistic Missile Defense in the Post-Cold War Era*, (Boulder, CO.: Westview Press, 1995), 74.

<sup>4</sup> J.W. Schomisch, *Guide to Theater Missile Defense*, (Arlington, VA.: Pasha Publications Inc., 1991), 41.

<sup>5</sup> *Ibid.*, 41.

<sup>6</sup> Cornell T. McGhee, "Elevating the Shield of Blows: Theater Missile Defense for the Twenty-First Century", (Army Command and General Staff College, Fort Leavenworth, Kansas, 1993), 17.

<sup>7</sup> John M. Pollin, "The Rumsfeld Commission Report Has Legs", *The Naval Institute Proceedings*, November 1999, 73.

<sup>8</sup> *Ibid.*, 73.

<sup>9</sup> LtCol Rocky Farry, "An Intelligent Approach to Theater Ballistic Missile Attack Operations" obtained from the Air Chronicles On-line Journal database at <http://www.airpower.maxwell.af.mil>; Internet; accessed 17 January 2000.

<sup>10</sup> *Ibid.*, 28.

<sup>11</sup> Department of the Army, "US Army Theater Missile Defense Operations," *FM 100-12*, (Fort Monroe: TRADOC, 1996), A-1-8.

<sup>12</sup> McGhee, 28.

<sup>13</sup> Brian C. Nickerson, "Theater Ballistic Missile Defense Operating Forward from the Sea," (Air War College, March 1997), 16.

<sup>14</sup> Ballistic Missile Defense Organization, *1995 Report to the Congress on Ballistic Missile Defense*, 01 October 1995, 2-35.

<sup>15</sup> Lt Gen Malcolm R. O'Neill, "Ballistic Missile Defense: 12 Years of Achievement," *Defense Issues* 10, no. 37 (1995), 7.

<sup>16</sup> Jonathan S. Landay, "US Missile Defense Drifting off Target?" *The Christian Science Monitor*, (March 26, 1998) obtained from on-line database available at <http://www.csmonitor.com>: Internet; accessed 18 January 2000.

<sup>17</sup> "Doctrine for Joint Theater Missile Defense," III-7.

<sup>18</sup> *Ibid.*, III-10.

<sup>19</sup> Department of the Army, "Joint Counterair/Theater Missile Defense Doctrine," *FM 44-100*, (Fort Monroe: TRADOC, 1998), III-3.

<sup>20</sup> Joint Chiefs of Staff, "Doctrine for Joint Operations," *Joint Pub 3-0*, (Washington: February, 1995), A-1.

<sup>21</sup> "Doctrine Joint for Theater Missile Defense," III-10.

<sup>22</sup> Commandant of the Marine Corps, "US Marine Corps Employment of Low Altitude Air Defense Battalion," *FMFM 5-52*, (MCB Quantico: MCCDC, 1990), 5-14.

<sup>23</sup> Joint Chiefs of Staff, "Department of Defense Dictionary of Military and Associated Terms," *Joint Pub 1-02*, (Washington: 15 April, 1998), 465.

<sup>24</sup> "Doctrine Joint for Theater Missile Defense," GL-2.

<sup>25</sup> Landay.

<sup>26</sup> Scott K McMahon, "Pursuit of the Shield: The US Quest for Limited Ballistic Missile Defense," (Lanham, MD: The University of Chicago Press, 1997), 316-319.

<sup>27</sup> "Doctrine for Joint Operations," A-1.

<sup>28</sup> Chief of Naval Operations, "Naval Operational Planning," *Naval Warfare Publication 5-01 (Rev.A)*, (Norfolk, VA: May 1998), A-4-1.

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